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# Ohio State Primer

## A Primer on Developing Ohio's Landfill Gas-to-Energy Potential

# Contents

# Introduction

## 1. About the Landfill Methane Outreach Program

The recovery of energy from landfill gas provides local and global environmental and energy benefits, as well as economic benefits. The methane captured from landfills can be transformed into a cost-effective fuel source for generating electricity and heat, firing boilers, or even powering vehicles.

To promote the use of landfill gas as an energy source, the U.S. Environmental Protection Agency (EPA) has established the Landfill Methane Outreach Program (LMOP). The goals of LMOP are to reduce methane emissions from landfills by:

- Encouraging environmentally and economically beneficial landfill gas-to-energy development
- Removing barriers to developing landfill gas-to-energy (LFGTE) projects

To achieve these goals, EPA establishes alliances with four key constituencies:

- State environmental and energy agencies
- Energy users/providers (including investor-owned, municipal and other public power utilities, cooperatives, direct end users, and power marketers)
- Industry (including developers, engineers, and equipment vendors)
- Community partners (municipal and small private landfill owners and operators; cities, counties, and other local governments; and community groups)

EPA establishes these alliances through a Memorandum of Understanding (MOU). By signing the MOU, each ally and partner acknowledges a shared commitment to promoting landfill gas energy recovery at solid waste landfills, recognizes that the widespread use of landfill gas as an energy resource will reduce methane and other air emissions, and commits to certain activities that enhance the development of this resource.

As of January 1999, over 240 landfill methane recovery projects are operating in the United States. EPA estimates that up to 750 landfills could install economically viable landfill energy projects by the year 2000.

### *LFGTE Projects in Ohio*

Ohio is a member of the LMOP State Ally Program, which encourages cooperation between EPA and state energy and environental agencies to promote the development of LFGTE resources. Table A lists landfills in Ohio that are potential candidates for LFGTE projects. In addition to those listed in the table, many smaller orphaned facilities are still producing gas and could be candidates for LFGTE projects (e.g., through partnerships involving multiple sites for which capital equipment is shared).

## Table A Candidate Landfills

| Landfill Name | County | Operational Status |
|---|---|---|
| Zimmer Industrial Solid Waste LF | Adams-Clermont | Closed |
| Ashland County LF | Ashland County | Open |
| Aluminum Smelting & Refining LF | Ashtabula County | Closed |
| Doherty Sanitary LF, Inc. | Ashtabula County | Closed |
| Millenium Inorg.Chem.Ashtabula LF | Ashtabula County | Closed |
| Reserve Environmental Services, Inc. LF | Ashtabula County | Closed |
| Athens-Hocking Reclamation Center LF | Athens-Hocking Joint* | Open |
| City of St. Mary's LF | Auglaize County | Open |
| Rumpke Waste LF | Brown County | Open |
| AK Steel Corp. Middleton Works LF | Butler County | Closed |
| Champion International Corp.–Reily LF | Butler County | Closed |
| AWS East Liverpool LF | Carroll-Columbiana-Harrison Joint* | Open |
| Wilmington Sanitary LF | Clinton County | Open |
| CSP Conesville Residual Waste LF | Coshocton-Fairfield-Licking-Perry* | Closed |
| Maws Fairfield Sanitary LF | Coshocton-Fairfield-Licking-Perry* | Open |
| Ohio Paperboard Corp. LF | Coshocton-Fairfield-Licking-Perry* | Closed |
| Owens-Corning Fiberglass LF | Coshocton-Fairfield-Licking-Perry* | Closed |
| Pine Grove Regional Facility LF | Coshocton-Fairfield-Licking-Perry* | Open |
| USAWS Coshocton LF | Coshocton-Fairfield-Licking-Perry* | Open |
| WMI Suburban (South) R & D LF | Coshocton-Fairfield-Licking-Perry* | Open |
| Crawford County LF | Crawford County | Open |
| BFI Glenwillow Sanitary LF | Cuyahoga County | Open |
| City of Brooklyn LF | Cuyahoga County | Open |
| LTV Steel Co. (Cuyahoga Co.) LF | Cuyahoga County | Closed |
| LTV Steel Co. Inc. (Cleveland) LF | Cuyahoga County | Closed |
| Royalton Road Sanitary LF | Cuyahoga County | Open |
| Defiance County LF | Defiance-Fulton-Paulding-Williams* | Open |
| GM Powertrain, GMC Defiance Plant LF | Defiance-Fulton-Paulding-Williams* | Closed |
| LaFarge Corp. LF | Defiance-Fulton-Paulding-Williams* | Closed |

## Table A Candidate Landfills (continued)

| Landfill Name | County | Operational Status |
|---|---|---|
| Erie County LF | Erie County | Open |
| Huron Lime Company LF | #2 Erie County | Closed |
| S.W. Authority of Central Ohio LF | Franklin County | Open |
| AEP Gavin Plant Residual Waste LF | Gallia-Jackson-Meigs-Vinton* | Closed |
| RWS Beech Hollow LF | Gallia-Jackson-Meigs-Vinton* | Open |
| US Waste Service Gallia Co. Sanitary LF | Gallia-Jackson-Meigs-Vinton* | Open |
| WCI Steel Inc. LF | Geauga-Trumbull* | Closed |
| Monsanto Company/Bond Road LF | Hamilton County | Open |
| Rumpke Waste Inc. (Cincinnati) LF | Hamilton County | Open |
| WMI E.L.D.A. R&D Facility LF | Hamilton County | Open |
| Hancock County Sanitary LF | Hancock County | Open |
| Henry County Sanitary LF | Henry County | Open |
| Holmes County LF | Holmes County | Open |
| Huron County LF | Huron County | Open |
| Lake County Solid Waste Facility LF | Lake County | Open |
| LWS Logan County (Cherokee Run) LF | Logan County | Open |
| BFI (Lorain County) LF | Lorain County | Open |
| Ohio Edison Edgewater Plant LF | Lorain County | Closed |
| Envirosafe Services HW & Industrial LF | Lucas County | Closed |
| Hoffman Road Sanitary LF | Lucas County | Open |
| AWS Mahoning LF | Mahoning County | Open |
| BFI Carbon Limestone LF | Mahoning County | Open |
| Central Waste, Inc. LF | Mahoning County | Open |
| Laidlaw W.S. (Mercer Co.) LF | Mercer County | Open |
| Fraser Papers Inc. LF | Montgomery County | Closed |
| Montgomery County Ash Monofill | Montgomery County | Open |
| WMOI Stoney Hollow LF | Montgomery County | Open |
| BFI Ottawa County LF | Ottawa-Sandusky-Seneca* | Open |
| Brush Wellman (New) LF | Ottawa-Sandusky-Seneca* | Closed |

## Table A Candidate Landfills (continued)

| Landfill Name | County | Operational Status |
|---|---|---|
| Genlime Group L.P. LF | Ottawa-Sandusky-Seneca* | Closed |
| Hocking Enviornmental Co. LF | Ottawa-Sandusky-Seneca* | Open |
| Redland Inc. (Millersville) LF | Ottawa-Sandusky-Seneca* | Closed |
| Redland Inc. (Woodville) LF | Ottawa-Sandusky-Seneca* | Closed |
| US Gypsum Company LF | Ottawa-Sandusky-Seneca* | Closed |
| DOE PGD Plant/X-735 LF | Pike County | Closed |
| Pike Sanitation LF | Pike County | Open |
| Preble County Sanitary LF | Preble County | Open |
| Putnam County LF | Putnam County | Open |
| Noble Road LF | Richland County | Open |
| AWS American LF | Stark-Tuscarowas-Wayne* | Open |
| AWS American Tire Monofill | Stark-Tuscarowas-Wayne* | Open |
| C&E Coal, Inc. Pilot Waste Tire Project LF | Stark-Tuscarowas-Wayne* | Open |
| Kimble Sanitary LF | Stark-Tuscarowas-Wayne* | Closed |
| Mt. Eaton East LF | Stark-Tuscarowas-Wayne* | Open |
| Rittman Paperboard LF | Stark-Tuscarowas-Wayne* | Closed |
| WMI Countywide R&D Facility LF | Stark-Tuscarowas-Wayne* | Open |
| Hardy Road (City of Akron) LF | Summit County | Open |
| BFI Bigfoot Run LF | Warren County | Open |
| WMI Evergreen Recreational & Disposal Facility LF | Wood County | Open |
| Wood County LF | Wood County | Open |
| National Lime & Stone LF | Wyandot County | Closed |
| Wyandot Sanitary (New) LF | Wyandot County | Open |

**Joint Solid Waste Management District (SWMD)*

# 2. Electricity Restructuring and LFGTE

## *What Is Electricity Restructuring?*

Electricity restructuring refers to the introduction of competition into both the wholesale and retail electricity markets. Until now, electric utilities operated as monopolies authorized by federal and state regulatory authorities as the sole provider of electric service to consumers within a specific service territory. Under restructuring, utilities will lose these monopolies, enabling other energy providers to compete for their customers. The result will be more energy options for consumers, lower energy prices, and greater use of renewable energy sources.

Efforts to restructure the electric utility industry began in 1978 with passage of the Public Utilities Regulatory Policies Act (PURPA), which required utilities to buy a portion of their power from unregulated power generators in an effort to encourage the development of smaller generating facilities, new technologies, and renewable energy sources. The National Energy Policy Act of 1992 (EPACT) expanded on PURPA, allowing more types of unregulated companies to generate and sell electricity, effectively creating a competitive wholesale market for electric power.

Restructuring at the retail level has been a hot issue in many states since the passage of EPACT, which delegated states the authority to introduce competition among electric utilities within their borders. As of January 1999, 14 states have enacted some form of restructuring legislation, while the remaining 36 are considering such legislation.

## *How Do These Changes Affect Landfill Gas Recovery?*

Many states are including renewable energy provisions in their restructuring legislation. Such provisions mandate utilities to include a certain percentage of electricity generated from renewable, or "green energy," sources into their energy mixes. LFGTE is one such green energy source.

In March 1998, the Clinton Administration unveiled its "Comprehensive Electricity Competition Plan" to restructure the electricity industry nationwide. Contained in that proposal is a Renewable Portfolio Standard (RPS) that would guarantee that a minimum percentage of the nation's electricity be powered by green energy. Energy service providers would be required to cover a percentage of their electricity sales with generation from non-hydroelectric renewable sources such as wind, solar, geothermal, and biomass (which includes LFGTE).

## *Marketing Landfill Gas Recovery as Green Power*

One of the emerging areas and most promising mechanisms to encourage utilities and other energy marketers to participate in LFGTE projects is the development of green marketing programs. Green marketing programs are designed to enable energy marketers to position renewable energy products (including LFGTE) as premium products, and therefore, collect a premium price from their customers. In addition, green marketing allows energy marketers in competitive marketplaces to differentiate their energy product, and allows utilities in non-restructured marketplaces to gain critical product marketing experience in preparation for competition. However, the general public is less familiar with LFGTE than other sources of renewable energy; support from the LMOP can help ensure the success of early LFGTE green marketing efforts.

## *Get the Latest Information on Electricity Restructuring in Your State*

For up-to-date information on electricity restructuring in Ohio, visit the Public Utilities Commission of Ohio (PUCO) Web site at http://www.puc.state.oh.us.

# 3. The Goals of This Primer

Permits, incentive programs, and policies for LFGTE project development vary greatly from state to state. To guide LFGTE project developers through the state permitting process and to help them to take advantage of state incentive programs, the LMOP has worked with state agencies to develop individual primers for states participating in the State Ally Program. By presenting the latest information on federal and state regulations and incentives affecting LFGTE projects in this primer, the LMOP and Ohio state officials hope to facilitate development of many of the landfills listed in Table A.

To develop this primer, the state of Ohio identified all the permits and funding programs that could apply to LFGTE projects developed in Ohio. It should be noted, however, that the regulations, agencies, and policies described are subject to change. Changes are likely to occur whenever a state legislature meets, or when the federal government imposes new directions on state and local governments. LFGTE project developers should verify and continuously monitor the status of laws and rules that might affect their plans or the operations of their projects.

## *Who Should Read This Primer?*

Throughout the country, the number of LFGTE projects is growing. Recovering methane gas at solid waste landfills provides significant environmental and economic benefits by eliminating methane emissions while capturing the emissions' energy value.

This primer is designed to help realize the potential of landfill gas recovery in the state of Ohio. It provides information for developers of LFGTE projects, as well as all other participants in such projects: landfill operators, utility companies, independent power producers, utility regulators, state regulators, engineers, and equipment vendors.

## *What Information Does This Primer Contain?*

If you are interested in taking advantage of the economic and environmental opportunities in LFGTE recovery in Ohio, you will need to know the regulatory requirements that apply. You will also need to know what economic incentives are available to help make these projects more economically viable.

To address these needs, this primer covers the following topics:

- *Federal Standards and Permits.* This section provides information on federal regulations that may pertain to LFGTE projects, including solid waste, air quality, and water quality regulations.
- *State Standards and Permits.* This section provides information on state permits that apply to landfill gas recovery projects in Ohio.
- *Local Standards and Permits.* Local permit approval will often be needed for LFGTE projects. This section offers a step-by-step process you can follow to secure this approval.
- *Federal Incentive Programs.* This section presents information on federal incentives that may apply to LFGTE projects.
- *State Incentive Programs.* This section presents information on the environmental infrastructure financing opportunities that are available in Ohio.

# 4. Where Can I Go For More Information?

The Ohio State Ally Contacts are:

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Ohio Air Quality Development Authority
50 W. Broad Street, #1901
Columbus, OH 43215
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614-752-9188 (fax)
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Ohio Biomass Energy Program
Public Utilities Commission of Ohio
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# Part 1: Standards and Permits

## 1. Overview Of Federal Standards And Permits

The following section discusses federal regulations that may pertain to LFGTE projects. LFGTE projects can be subject to solid waste, air quality, and water quality regulations. The federal regulations are presented in general terms, because individual state/local governments generally develop their own regulations for carrying out the federal mandates. Specific requirements may therefore differ among states. Project developers will have to contact relevant federal agencies and, in some cases, state agencies for more detailed information and applications. The discussion of each key federal standard/permit contains three components:

- Importance of the standard/permit to LFGTE project developers
- Applicability to LFGTE projects
- Description of each standard/permit

### 1.1 Resource Conservation and Recovery Act Subtitle D

**Importance:** Before a LFGTE project can be developed, all Resource Conservation and Recovery Act (RCRA) Subtitle D requirements (i.e., requirements for non-hazardous waste management) must be satisfied.

**Applicability:** Methane is explosive in certain concentrations and poses a hazard if it migrates beyond the landfill facility boundary. Landfill gas collection systems must meet RCRA Subtitle D standards for gas control.

**Description:** Since October 1979, federal regulations promulgated under Subtitle D of RCRA required controls on migration of landfill gas. In 1991, EPA promulgated landfill design and performance standards; the newer standards apply to municipal solid waste landfills that were active on or after October 9, 1993. Specifically, the standards require monitoring of LFG and establish performance standards for combustible gas migration control. Monitoring requirements must be met at landfills not only during their operation, but also for a period of 30 years after closure.

Landfills affected by RCRA Subtitle D are required to control gas by establishing a program to periodically check for methane emissions and prevent offsite migration. Landfill owners and operators must ensure that the concentration of methane gas does not exceed:

- 25 percent of the lower explosive limit for methane in facilities' structures
- the lower explosive limit for methane at the facility boundary

Permitted limits on methane levels reflect the fact that methane is explosive within the range of 5 to 15 percent concentration in air. If methane emissions exceed permitted limits, corrective action (i.e., installation of a LFG collection system) must be taken. Subtitle D may provide an impetus for some landfills to install energy recovery projects in cases where a gas collection system is required for compliance (see 40 CFR Part 258 for more information).

## 1.2 Clean Air Act (CAA)

The CAA regulates emissions of pollutants to ensure that air quality meets specified health and welfare standards. The CAA contains two provisions that may affect LFGTE projects: New Source Performance Standards (NSPS) and New Source Review (NSR). Facilities that are planning to construct a new LFGTE system or that plan to modify a landfill operation to incorporate a LFGTE system must obtain an Authority to Construct (ATC) permit (in Ohio, a Permit to Install) from the responsible air regulatory agency if emissions from the project exceed the major facility emission thresholds. The ATC permit specifies the NSPS and NSR requirements that the project must meet. Once construction is complete, the facility must obtain an operating permit that meets the requirements defined in Title V of the 1990 CAA Amendments. The general requirements of NSPS, NSR, and Title V for LFGTE projects are discussed below.

### *Non-Methane Organic Compounds (NMOCs) Emissions: New Source Performance Standards (NSPS):*

**Importance:** LFGTE projects can be part of a compliance strategy to meet EPA's new emissions standards for landfill gas.

**Applicability:** Landfills meeting certain design capacity, age, and emissions criteria are required to collect LFG and to either flare it or use it for energy.

**Description:** EPA final regulations under Title I of the CAA Amendments require affected landfills to collect and control LFG. Specifically, the CAA targets reductions in the emissions of NMOCs found in LFG because they contribute to local smog formation. For landfills that received waste after November 8, 1987 ("existing landfills"), the standards are "Emissions Guidelines" (EG), and for landfills that commenced construction, reconstruction, modification, or began accepting waste on or after May 30, 1991 ("new landfills"), the standards are "New Source Performance Standards" (NSPS). The final regulations can be found in the Federal Register, March 12, 1996, Vol. 61, No. 49, pgs. 9907-9944, or can be obtained from the National Technical Information Service (NTIS) at (703) 487- 4650 or http://www.ntis.gov. Ask for PB96 - 153465.

The basic requirements are the same for both existing and new landfills. Landfills that meet both of the following criteria must comply with the regulations.

- Capacity—maximum design capacity greater than or equal to 2.5 million Mg (or 2.5 million cubic meters).[1]
- Emissions —annual NMOC emission rate is greater than 50 Mg.

### *Air Emissions: New Source Review (NSR) Permitting Process*

**Importance:** New LFGTE projects may be required to obtain construction permits under New Source Review (NSR). Depending on the area in which the project is located, obtaining these permits may be the most critical aspect of project approval.

**Applicability:** The combustion of LFG results in emissions of carbon monoxide and oxides of nitrogen. Requirements vary for control of these emissions depending on local air quality. The relevant standards for a particular area will be discussed in Section 2, State Standards and Permits. Applicability of these standards to LFGTE projects will depend on the level of emissions resulting from the technology used in the project and the project's location (i.e., attainment or non-attainment area).

[1] Landfills with less than 2.5 million Mg are required to file a design capacity report.

**Description:** CAA regulations require new stationary sources and modifications to existing sources of certain air emissions to undergo NSR before they can operate. The purpose of these regulations is to ensure that sources meet the applicable air quality standards for the area in which they are located. Because these regulations are complex, a landfill owner or operator may want to consult an attorney or expert familiar with NSR for more information about permit requirements in a particular area.

The existing CAA regulations for attainment and maintenance of ambient air quality standards regulate six criteria pollutants — ozone, nitrogen dioxide ($NO_2$), carbon monoxide (CO), particulate matter (PM-10), sulfur dioxide ($SO_2$), and lead. The CAA authorizes the EPA to set both health- and public welfare-based national ambient air quality standards (NAAQS) for each criteria pollutant. Areas that meet the NAAQS for a particular air pollutant are classified as being in "attainment" for that pollutant and those that do not are in "non-attainment." Because each state is required to develop an air quality implementation plan (called a State Implementation Plan or SIP) to attain and maintain compliance with the NAAQS in each Air Quality Control Region within the state, specific permit requirements will vary by state. (See 40 CFR 51.160-51.166 for more information.)

The location of the LFGTE project will dictate what kind of construction and operating permits are required. If the landfill is located in an area that is in attainment for a particular pollutant, the LFGTE project must undergo Prevention of Significant Deterioration permitting. Nonattainment Area permitting is required for those landfills that are located in areas that do not meet the NAAQS for a particular air pollutant. Furthermore, the level of emissions from the project determines whether the project must undergo major NSR or minor NSR. The requirements of major NSR permitting are greater than those for minor NSR. The following provides more detail on new source permits:

### Prevention of Significant Deterioration Permitting

Prevention of Significant Deterioration (PSD) review is used in attainment areas to determine whether a new or modified emissions source will cause significant deterioration of local air quality. The State air office can assist LFG project developers in determining whether a proposed project requires PSD approval.

All areas are governed to some extent by PSD regulations because no location is in nonattainment for all criteria pollutants. Applicants must determine PSD applicability for each individual pollutant. For gas-fired sources, PSD major NSR is required if the new source will emit or has the potential to emit any criteria pollutant at a level greater than 250 tons per year.

For each pollutant for which the source is considered major, the PSD major NSR permitting process requires that the applicants determine the maximum degree of reduction achievable through the application of available control technologies. Specifically, major sources may have to undergo any or all of the following four PSD steps:

- Best Available Control Technology (BACT) analysis
- Monitoring of local air quality
- Source impact analysis/modeling
- Additional impact analysis/modeling (i.e., impact on vegetation, visibility, and Class I areas)[2]

Minor sources and modifications (i.e., below 250 tons per year) are exempt from this process, but these sources must still obtain construction and operating air permits (see CFR. 40 CFR 52.21 for more information on PSD).

[2]Class I areas are specified under the Clean Air Act and include national parks. Projects situated within a certain distance from Class I areas are subject to more stringent criteria for emissions levels.

**Nonattainment Air Permitting**

An area that does not meet the NAAQS for one or more of the six criteria pollutants is classified as being in "nonattainment" for that pollutant. Ozone is the most pervasive nonattainment pollutant, and the one most likely to affect LFGTE projects. A proposed new emissions source or modification of an existing source located in a nonattainment area must undergo nonattainment major NSR if the new source or the modification is classified as major (i.e., if the new or modified source exceeds specified emissions thresholds). To obtain a nonattainment NSR permit for criteria pollutants, a project must meet two requirements:

- Must use technology that achieves the Lowest Achievable Emissions Rate (LAER) for the nonattainment pollutant.
- Must arrange for an emissions reduction at an existing combustion source that offsets the emissions from the new project at specific ratios.

**Potential Exemptions**

EPA recently furnished a guidance document to state and regional permitting authorities that provides an exemption from major NSR permitting requirements for landfill projects that qualify as "pollution control projects." An existing landfill that plans to install a LFGTE recovery project may qualify as a pollution control project as long as it reduces non-methane organic compounds (NMOC) at the site. Under the guidance, the permitting authority may exempt the project from major NSR, provided it meets all other requirements under the CAA and the state, including minor source requirements. In nonattainment areas, offsets will still be required, but need not exceed a 1:1 ratio. States have discretion to exercise the increased flexibility allowed by the guidance on a case-by-case basis.

### *Title V Operating Permit*

**Importance:** Many LFGTE projects must obtain operating permits that satisfy Title V of the 1990 CAA Amendments.

**Applicability:** Any LFGTE plant that is a major source, as defined by the Title V regulation (40 CFR Part 70), must obtain an operating permit.

**Description:** Title V of the CAA requires that all major sources obtain new federally enforceable operating permits. Title V is modeled after a similar program established under the National Pollution Discharge Elimination System (NPDES). Each major source must submit an application for an operating permit that meets guidelines spelled out in individual state Title V programs. The operating permit describes the emission limits and operating conditions that a facility must satisfy, and specifies the reporting requirements that a facility must meet to show compliance with the air pollution regulations. A Title V operating permit must be renewed every 5 years.

## 1.3 National Pollutant Discharge Elimination System (NPDES) Permit

**Importance:** LFGTE projects may need to obtain NPDES permits for discharging wastewater that is generated during the energy recovery process.

**Applicability:** LFG condensate forms when water and other vapors condense out of the gas stream due to temperature and pressure changes within the collection system. This wastewater must be removed from the collection system. In addition, LFGTE projects may generate wastewater from system maintenance and cooling tower blowdown.

**Description:** NPDES permits regulate discharges of pollutants to surface waters. The authority to issue these permits is delegated to state governments by EPA. The permits, which typically last five years, limit the quantity and concentration of pollutants that may be discharged. To ensure compliance with the limits, permits require wastewater treatment or impose other operation conditions. The state water offices or EPA regional office can provide further information on these permits.

The permits are required for three categories of sources and can be issued as individual or general permits. A LFGTE project would be included in the "wastewater discharges to surface water from industrial facilities" category and would require an individual permit. An individual permit application for wastewater discharges typically requires information on:

- Water supply volumes
- Water utilization
- Wastewater flow
- Characteristics and disposal methods
- Planned improvements
- Storm water treatment
- Plant operation
- Materials and chemicals used
- Production
- Other relevant information

## 1.4 Clean Water Act, Section 401

**Importance:** LFGTE projects may need CWA Section 401 certification for constructing pipelines that cross streams or wetlands.

**Applicability:** LFG recovery collection pipes or distribution pipes from the landfill to a nearby gas user may cross streams or wetlands. When construction or operation of such pipes causes any discharge of dredge into streams or wetlands, the project may require Section 401 certification.

**Description:** If the construction or operation of facilities results in any discharge into streams or wetlands, such construction is regulated under Section 401. This requirement may affect the construction of LFGTE project facilities or pipelines to transport LFG.

The applicant must obtain a water quality certification from the State in which the discharge will originate. The certification should then be sent to the U.S. Army Corps of Engineers. The certification indicates that such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act (CWA).

## 1.5 Other Federal Permit Programs

The following are brief descriptions of how other federal permits could apply to LFGTE project development.

- RCRA Subtitle C could apply to a LFG project if it produces hazardous waste. While some LFG projects can return condensate to the landfill, many dispose of it through the public sewage system after some form of on-site treatment. In some cases, the condensate may contain high enough concentrations of heavy metals and organic chemicals for it to be classified as a hazardous waste, thus triggering federal regulation.
- The Historic Preservation Act of 1966 or the Endangered Species Act could apply if power lines or gas pipelines associated with a project infringe upon an historic site or an area that provides habitat for endangered species.

[3] The permits contained in this handbook were suggested by state permitting agencies.

# 2. State Standards and Permits

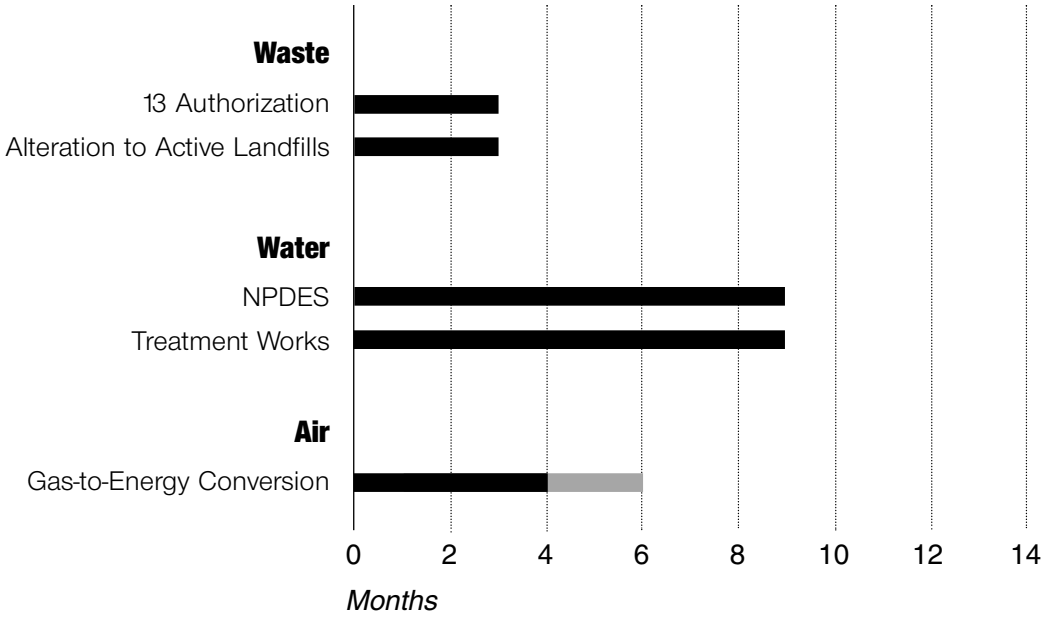
This section provides information on permits required by the State of Ohio for the development of a LFGTE project.[3] Information provided on each permit includes how the permit is applicable to LFGTE projects, the appropriate agency contact, a description of the permit; the statute/regulation, information required and suggestions for a successful application, the application and review process, the review/approval period, and any fees required. For an overview of required permits, contact information, and length of the review period, see Tables 2.1 and 2.2.

[3]The permits contained in this handbook were suggested by state permitting agencies.

## Table 2.1 Summary Table of State Standards/Permits

| Standard | Permit | Agency/Contact | Appropriate Review Period |
|---|---|---|---|
| **Waste** | *13 Authorization* | District Office | 90 days |
| | *Alteration to active landfills* | District Office | 90 days |
| **Water** | *NPDES* | District Office | 9 months |
| | *Treatment Works* | District Office | 9 months |
| **Air** | *Gas-to-Energy Conversion* | See Appendix A (Tables A-2 and A-3) | 4-6 months for each |
| | *Gas Piped Off-site* | See Appendix A (Tables A-2 and A-3) | N/A |

## Table 2.2 Permit Approval Timeline




**Notes**
Solid black line denotes the minimum review/approval period (where applicable); gray line denotes the maximum.

The remainder of Section 2 contains information about each of the permits required by Ohio for LFGTE project development. The information is organized into tables containing the following information:

- Applicability to LFG Projects
- Agency Contact
- Description of the Regulation
- Statute/Regulation
- Information Required/Suggestions
- Application Process
- Review Process
- Review/Approval Period
- Fees

## Table 2.3 Solid Waste: 13 Authorization

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Closed landfills |
| **Agency Contact** | District office (see Appendix A) |
| **Description** | Authorization to disturb a solid waste facility |
| **Statute/Regulation** | ORC 3734.02(H) / OAC 3745-27-13 |
| **Information Required/Suggestions** | See regulation: location, describe activity, past/current authorizations, how to protect environment (run-on, run-off, waste management, repair cap) |
| **Application Process** | Prior to installation, submit request to district office. |
| **Review Process** | District office will review for deficiencies, or if needed, ask for more information. Applicant will be informed. If the application is approved, the director will grant authorization. |
| **Review/Approval Period** | On average 90 days (although exact time varies) |
| **Fees** | None |

## Table 2.4 Solid Waste: Alteration to Active Landfills

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Active landfills |
| **Agency Contact** | District office (see Appendix A) |
| **Description** | Concurrence to deviate from approved permit |
| **Statute/Regulation** | OAC 3745-27-19 (c) |
| **Information Required/Suggestions** | Any changes to the design/operation of landfill, how to manage condensate, placement of extraction wells and leader lines. Don't puncture liner, keep cap integrity. |
| **Application Process** | Prior to installation, submit alteration request to district office. |
| **Review Process** | District office will review for deficiencies. If more information is needed, applicant will be informed. If the application is approved, the director will send concurrence letter. |
| **Review/Approval Period** | On average, 90 days (although exact time varies) |
| **Fees** | None |

## Table 2.5 Water: NPDES*

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Wastewater (condensate) discharge |
| **Agency Contact** | District office (see Appendix A) |
| **Description** | Authorization to discharge to sewer or surface water. Establishes limits. |
| **Statute/Regulation** | ORC 6111 |
| **Information Required/Suggestions** | Amount of pollutants and their concentration |
| **Application Process** | Submit to district office. |
| **Review Process** | If requested by public, a public hearing is held. |
| **Review/Approval Period** | 9 months |
| **Fees** | Based on flow—maximum of $750/outfall |

**Ohio EPA recommends that applicants avoid discharge to surface water. The agency prefers discharge to sewer or haul to wastewater treatment plant.*

## Table 2.6 Water: Treatment Works

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Treat or pretreat wastewater (condensate) prior to discharge. |
| **Agency Contact** | District office (see Appendix A) |
| **Description** | Authorization to construct treatment works |
| **Statute/Regulation** | ORC 6111 |
| **Information Required/Suggestions** | Must show can meet discharge limits in NPDES permit. Include engineering drawings. |
| **Application Process** | Submit to district office. |
| **Review Process** | If requested by the public, a public hearing is scheduled. |
| **Review/Approval Period** | 9 months |
| **Fees** | Fee based on construction cost. Maximum of $15,000. |

## Table 2.7 Air (Gas-to-Energy Conversion)

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Gas-to-energy conversion |
| **Agency Contact** | See Appendix A |
| **Description** | Both NSPS[1] and existing landfills |
| **Statute/Regulation** | PTI[2]: OAC 3745-31-05<br>PTO[3]: OAC 3745-35 |
| **Information Required/Suggestions** | PTI and PTO required |
| **Application Process** | Submit application to appropriate agency contact. |
| **Review Process** | Review for accuracy and deficiencies. Additional information may be requested. A public hearing may be scheduled. |
| **Review/Approval Period** | 4-6 months for each permit |
| **Fees** | Based on emission levels ($2,000/cap) |

*[1]PTI (Permit to Install) needed before construction can commence.*

*[2]PTO (Permit to Operate) must be applied for within first year of source operation.*

*[3]NSPS (New Source Performance Standard) is applied to landfill sources built after May 30, 1991. (An "existing landfill" is one that has been accepting waste since Nov. 8, 1987.)*

## Table 2.8 Air

| | |
|---|---|
| **Applicability to Landfill Gas Projects** | Gas piped off site. |
| **Agency Contact** | See Appendix A |
| **Description** | Both NSPS and existing landfills. |
| **Statute/Regulation** | N/A |
| **Information Required/Suggestions** | No permit required. |
| **Application Process** | N/A |
| **Review Process** | N/A |
| **Review/Approval Period** | N/A |
| **Fees** | N/A |

# 3. Overview of Local Standards and Permits

Within the framework of federal and state regulation, local governments will have some jurisdiction over LFGTE development in nearly all cases. Typically, local permits address issues that affect the surrounding community. These permits generally fall under the categories of construction, environment and health, land use, and water quality/use. Local governments are also responsible for administering some permits for federal and state regulations in addition to their own. For example, many local governments are responsible for ensuring compliance with federal air quality regulations. It should be noted, however, that some local standards and regulations are more strict than state or federal regulations.

### Steps to Successful Local Permit Approval:

The following six steps will assist LFGTE project developers to achieve successful local permit approval:

**Step 1** Determine which local authorities have jurisdiction over the project site.

**Step 2** Contact local, city, and/or county planning and public works departments to obtain information about applicable permits and to discuss your plans. Meeting with agency staff to discuss the landfill gas project and required permits often helps expedite the permitting process.

**Step 3** Obtain essential information regarding each permit, including:

- what information is required
- the permitting process that should be followed
- time frames (including submittal, hearing, and decision dates)

**Step 4** Obtain copies of the regulations to compare and verify what is required in the permit applications. If they differ, contact the appropriate permitting agency.

**Step 5** Submit a complete application. Incomplete applications typically result in processing delays.

**Step 6** Attend meetings or hearings where the application will be discussed to respond to any questions that are raised. Failure to do so could result in delays.

### Typical Local Permits

The table on the following page provides typical local permits and approvals required for LFGTE projects.

## Table 3.1 Local Permits and Standards

| Permit | Description |
|---|---|
| **Building Permit** | Most county/local governments require building permits for construction, which entail compliance with several types of building codes, such as plumbing and electrical. A typical building permit application may require detailed final plans for structures, including electrical and plumbing plans, floor layout, sewage facilities, storm water drainage plan, size and shape of lot and buildings, setback of buildings from property lines and drain field, access, size and shape of foundation walls, air vents, window access, and heating or cooling plants (if included in the design). |
| **Zoning/Land Use** | Most communities have a zoning and land use plan that identifies where different types of development are allowed (i.e., residential, commercial, and industrial). The local zoning board determines whether a particular project meets local land use criteria, and can grant variances if conditions warrant. A landfill gas project may require an industrial zoning classification. |
| **Storm Water Management** | Some local public works departments require a permit for discharges during construction and operation of a LFGTE project. Good facility design that maintains the pre-development runoff characteristics of the site will typically enable the project to meet permitting requirements easily. |
| **Solid Waste Disposal** | A LFGTE project may generate solid wastes, such as packaging material, cleaning solvents, and equipment fluids. If the landfill is closed, disposal of these solid wastes may be subject to review by a local authority. |
| **Wastewater** | The primary types of wastewater likely to be generated by a LFGTE project include maintenance wastewater and cooling tower blowdown. The city engineer's office should be contacted to provide information about available wastewater handling capacity, and any unique condensate treatment requirements or permits for landfills. |
| **Fire Hazards and Precautions** | The mix of gases in landfill gas has a moderate to high explosion potential; methane is explosive in concentrations of 5 to 15 percent in air. Because methane has the potential to migrate from the landfill to onsite or offsite structures, it poses a significant public safety hazard. EPA requires that methane concentrations be less than 5 percent at a landfill property line, and less than 1.5 percent in a facility's structures. County regulations may call for as strict or stricter standards to be observed at the landfill. |
| **Noise** | Most local zoning ordinances stipulate the maximum allowable decibel levels from noise sources. These levels vary depending on the location of the site. For example, LFG energy recovery projects located near residential areas will likely have to comply with stricter noise level standards than projects located in non-populated areas. |

# Part 2: Incentive Programs

## 1. Overview of Federal Incentive Programs

There are three federal incentive programs that may apply to LFGTE projects: the Section 29 Tax Credit, the Renewable Energy Production Incentive (REPI), and the Qualifying Facilities (QF) Certification. Each program is described below.

### 1.1 Section 29 Tax Credit

Developers of LFGTE projects who sell LFG to an unrelated third party may qualify for a tax credit under Section 29 of the Internal Revenue Service (IRS) tax code. In order to take advantage of the credits, project developers may bring in an outside party when developing power projects. The Section 29 tax credit was established in 1979 to encourage development of unconventional gas resources, such as landfill gas. Section 29 tax credits are available through 2007 to LFG projects that have a gas sales agreement in place by December 31, 1996 and are placed in service by June 30, 1998. The credit has been extended several times by the U.S. Congress, but there is no guarantee that these extensions will continue. The credit is worth $3.00 per barrel of oil-equivalent (on a MMBtu basis) and is adjusted annually for inflation; currently, it is worth $0.979 per MMBtu — about 1.2 ¢/kWh for a typical landfill gas electricity project.

### 1.2 Renewable Energy Production Incentive (REPI)

The Renewable Energy Production Incentive (REPI), mandated under the Energy Policy Act of 1992, may provide a cash subsidy of up to $0.015 per kWh to owners and operators of qualified renewable energy sources, such as landfills, that began operation between October 1993 and September 2003.[4] The Department of Energy (DOE) will make incentive payments for 10 fiscal years, beginning with the fiscal year in which application for payment for electricity generated by the facility is first made and the facility is determined by DOE to be eligible for receipt of an incentive payment. The period for payment under this program ends in fiscal year 2013.

For further information, contact:

U.S. Department of Energy
National Renewable Energy Laboratory
Golden Field Office
Golden, Colorado 80403
(303) 275-4706

U.S. Department of Energy
Efficiency and Renewable Energy
Forrestal Building, Mail Station EE-10
1000 Independence Avenue, S.W.
Washington, DC 20585
Phone: (202) 586-4564

[4] Final Rule Making, 10 Federal Register Part 451, July 19, 1995, Vol. 60, No. 138.

## 1.3 Qualifying Facilities Certification

LFGTE projects that generate electricity will benefit from Qualifying Facilities (QF) certification, which is granted through the Federal Energy Regulatory Commission (FERC). The following describes the benefits of QF status and the steps for applying for such status.

The Public Utility Regulatory Policies Act (PURPA) — one of five parts of the National Energy Act of 1978 — was designed to promote conservation of energy and energy security by removing barriers to the development of cogeneration facilities and facilities that employ waste or renewable fuels. Such facilities are called Qualifying Facilities, or QFs. Under PURPA, utilities are required to purchase electricity from QFs at each utility's avoided cost of generating power. PURPA provides that a small power production facility, such as a LFGTE project that meets FERC standards, can become a QF.

In order to apply for QF status, applicants must prepare either (1) a Notice of Self-Certification, which asserts compliance with the FERC's technical and ownership criteria, or (2) an Application for Commission Certification of Qualifying Status, which requires a draft Federal Register notice and which provides actual FERC approval of QF status. In either case, the applicant must also file Form 565, which is a list of questions about the project, and must pay any filing fees associated with certifications, exemptions, and other activities. FERC will provide the QF "Info Packet" that describes the necessary steps, requirements, and background information. After submittal of the initial application, further justifications and submittal of information may be required.

For the QF Info Packet and applications, contact:

Federal Energy Regulatory Commission
Qualifying Facilities Division
825 North Capitol Street, N.E.
Washington, DC 20426
Phone: (202) 208-0571

# 2 State Incentive Programs

The Ohio Air Quality Development Authority (OAQDA) provides tax-exempt or taxable financing for qualified landfill methane gas projects. Various financing structures are available: direct purchase, turnkey, performance-based contracts, leasing, etc. For private sector entities, tax incentives include exemptions from real and personal property taxes, as well as sales and use taxes.

The OAQDA is a conduit financing agency; its bonds are based on project analysis and revenue streams. They do not represent the faith and credit of the State of Ohio. Projects financed range from $14,000 to $350 million.

For further information, contact:

Mark R. Shanahan
Executive Director
Ohio Air Quality Development Authority
50 W. Broad Street, #1901
Columbus, OH 43215
614-224-3383
614-752-9188 (fax)
mark.shanahan@AQDA.state.oh.us

In addition, Ohio is one of seven states participating in the Great Lakes Regional Biomass Energy Program. The Regional Program is administered by the Council of Great Lakes Governors and receives funding from the U.S. Department of Energy. Both the regional program and the state program provide periodic funding assistance to support the development and use of biomass resources.

For further information, contact:

Anne Goodge, Program Director
Ohio Biomass Energy Program
Public Utilities Commission of Ohio
180 East Broad Street
Columbus, OH 43215-3793
614-644-7857
anne.goodge@puc.state.oh.us

# Appendix A: State Contacts

## Table A-1

### District Offices

Central District Office (CDO)
3232 Alum Creek Drive
Columbus, Ohio 43207-3417
614-728-3778
1-800-686-2330

Northwest District Office (NWDO)
347 North Dunbridge Road
Bowling Green, Ohio 43402
419-352-8461
1-800-686-6930

Southwest District Office (SWDO)
401 East Fifth Street
Dayton, Ohio 45402-2911
937-285-6357
1-800-686-8930

Northeast District Office (NEDO)
2110 East Aurora Road
Twinsburg, Ohio 44087
330-963-1200
1-800-686-6330

Southeast District Office (SEDO)
2195 Front Street
Logan, Ohio 43138
740-385-8501
1-800-686-7330

## Table A-2

### Ohio EPA Offices and Local Air Pollution Control Agencies

*Agency Number/Agency Name*

01 Ohio EPA, CDO
Air Pollution Group
3232 Alum Creek Drive
Collumbus, Ohio 43207
614-728-3778

02 Ohio EPA, NEDO
Air Pollution Group
2110 East Aurora Road
Twinsburg, Ohio 44087
216-425-9171

03 Ohio EPA NWDO
Air Pollution Group
347 North Dunbridge Road
P.O. Box 466
Bowling Green, Ohio 43402
937-285-6357

04 Toledo Environmental Control
348 South Erie
Toledo, Ohio 43602
419-936-3015

05 Ohio EPA, SWDO
Air Pollution Group
401 East Fifth Street
Portsmouth, Ohio 45662
740-353-5156

06 Ohio EPA, SEDO
Air Pollution Group
2195 Front Street
Logan, Ohio 43138
614-385-8501

07 Air Pollution Group
Portsmouth City Health Dept.
740 Second Street
Portsmouth, Ohio 45662
740-353-5156

08 RAPCA
451 West Third Street
P.O. Box 972
Dayton, Ohio 45422
937-225-4435

13 Bureau Engineering Services
Div. of Air Pollution Control
1925 St. Clair
Cleveland, Ohio 44114
216-664-2324

14 Hamilton County Dept. of
Environmental Services
250 William Howard Taft Road
Cincinnati, Ohio 45219
513-946-7777

15 Div. Of Air Pollution Control
Canton City Health Dept.
420 Market Avenue, N.
Canton, Ohio 44702-1544
330-489-3385
330-489-3231

16 Akron Air Pollution Control
146 South High Street
Room 904
Akron, Ohio 44309
330-375-2480

## Table A-3

The following list indicates which local agency or district office of the Ohio EPA (as listed on Table A-2) should be contacted regarding filing for, modification to, or questions about Air Permits to Install (PTI), Permits to Operate (PTO) and Variances.

| Political Jurisdiction | Agency Number |
|---|---|
| Adams County (01) | 7 |
| Allen County (02) | 3 |
| Ashland County (03) | 3 |
| Astabula County (04) | 2 |
| Athens Country (05) | 6 |
| Auglaize (08) | 3 |
| Belmont Count (07) | 6 |
| Brown County (08) | 7 |
| Butler County (09) | 14 |
| Carroll County (10) | 2 |
| Champaign County (11) | 5 |
| Clark County (12) | 8 |
| Clermont County (13) | 14 |
| Clinton County (14) | 5 |
| Colunbiana County (15) | 2 |
| Coshocton County (16) | 6 |
| Crawford County (17) | 3 |
| Cuyahoga County (18) | 13 |
| Darke County (19) | 1 |
| Defiance County (20) | 3 |
| Delaware County (21) | 1 |
| Erie County (22) | 3 |
| Fairfield County (23) | 1 |
| Fayette County (24) | 1 |
| Franklin County (25) | 1 |
| Fulton County (26) | 3 |
| Gallia County (27) | 6 |
| Geauga County (28) | 2 |
| Greene County (29) | 8 |
| Guernsey County (30) | 6 |
| Hamilton County (31) | 14 |
| Hancock County (32) | 3 |
| Hardin County (33) | 3 |
| Harrison County (34) | 6 |
| Henry County (35) | 3 |
| Highland County (36) | 5 |
| Hocking County (37) | 6 |
| Holmes County (38) | 2 |
| Huron County (39) | 3 |
| Jackson County (40) | 6 |
| Jefferson County (41) | 6 |
| Knox County (42) | 1 |
| Lake County (43) | 2 |
| Lawrence County (44) | 7 |
| Licking County (45) | 1 |
| Logan County (46) | 5 |
| Lorain County (47) | 2 |
| Lucas County (48) | 4 |
| Madison County (49) | 1 |
| Mahoning County (50) | 2 |
| Marion County (51) | 3 |
| Medina County (52) | 16 |
| Meigs County (53) | 6 |
| Mercer County (54) | 3 |
| Miami County (55) | 8 |
| Monroe County (56) | 6 |
| Montgomery County (57) | 8 |
| Morgan County (58) | 6 |
| Morrow County (59) | 1 |
| Muskingum County (60) | 6 |
| Noble County (61) | 6 |
| Ottawa County (62) | 3 |
| Paulding County (63) | 3 |
| Perry County (64) | 6 |
| Pickaway County (65) | 1 |
| Pike County (66) | 6 |
| Portage County (67) | 16 |
| Preble County (68) | 8 |
| Putnam County (69) | 3 |
| Richland County (70) | 3 |
| Ross County (71) | 6 |
| Sandusky County (72) | 3 |
| Scioto County (73) | 7 |
| Seneca County (74) | 3 |
| Shelby County (75) | 5 |
| Stark County (76) | 15 |
| Summit County (77) | 16 |
| Trumbull County (78) | 2 |
| Tuscarawas County (79) | 6 |
| Union County (80) | 1 |
| Van Wert County (81) | 3 |
| Vinton County (82) | 6 |
| Warren County (83) | 14 |
| Washington County (84) | 6 |
| Wayne County (85) | 2 |
| Williams County (86) | 3 |
| Wood County (87) | 3 |
| Wyandot County (88) | 3 |